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ABSTRACT

This publication is divided into two major sections. The first section presents the objectives of science programs of the Arab League Educational, Cultural and Scientific Organization (ALECSO). Sources of the program components and guidelines of carrying out programs are also presented. The second section presents a translation of a condensed version of the Arabic text on ALECSO's activities in the field of science and technology. The activities planned for the period from 1974 to 1977 are classified in five areas: (1) Scientific publication; (2) Environmental sciences and natural resources; (3) Center for scientific equipment; (4) Technology of science teaching; and (5) Scientific research and development. Each of these five areas includes a description of planned programs. Training courses and workshops for different areas are also presented. The technology of science teaching section is devoted to describing the process of developing instructional materials in mathematics, biology, integrated science, and physics for different educational levels in the Arab countries. (HM)

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ALECSO's Activities in the Field of Science and Technology of the Arab States (1974-1977)

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OBJECTIVES OF SCIENCE PROGRAMMES

1. Promoting the activation of scientific progress in Arab countries, supporting its scientific potentialities, aiding the establishments of programmes of scientific studies and research, and directing it towards serving the aims of the Arab scientific development.

2. Promoting the integration between the scientific research and the socio-economic development in the Arab countries, in order to put the scientific endeavour in the context of applications. Scientific progress and development need to serve programmes of social, agricultural, and industerial development, and the pursuit of science should become the application of science.

3. Developing human resources of the Arab countries on rational scientific bases and directing the scientific research towards that aim. Policy and planning for developing human resources should be on bases of scientific studies and technical research.

4. Promoting interest in problems of the environment. Environment presents the framework within which man practices his vital and social activity ; also it represents the main source of wealth and the depot of production components. The environment concerns have special importance in the Arab area. Firstly, the Arab ecological conditions of its extended deserts and the sources of its renewable wealth depend upon the delicate balances of the environment. Secondly, its non-renewable sources of wealth (minerals, petroleum, and underground water) need to be developed rationally.

5. Establishing communication channels between the Arab scientific organizations, and fostering the cooperation between institutions concerned with promotion of science and its application in Arab countries: exchange of experiences and sharing in coordinated programmes.

6. Publication of the contemporary Arab scientific achievements: in the Arab countries to increase its application and to avoid repitition; and in world at large to present the features of the Arab scientific contributions.

7. Creating channels for communication between international science and Arab scientific institutions in order to benefit from the world scientific developments, especially in the fields of research and development and science teaching in various educational levels.

8. Promoting the Arab benefit of, and participation in, international programmes, the United Nations and its Organizations programmes in the fields of science, technology and its applications. Also directing the regional sectors of these international programmes to serve the Arab countries, and increase the proficiency of its performance.

9. Promoting scientific concepts to be firmly rooted in the social texture and the general culture, by means of supporting the programmes of dissemination of science.

10. Supporting scientific unions, assemblies, and societies in the Arab World, and encouraging the relations between these organizations and the similar international bodies for the benefit of the Arab scientific communities.

Sources of the Programmes Components

1. Following up and implementation of programmes adopted by the general conferences of the Arab League Educational, Cultural, and Scientific Organization (ALECSO).

2. Decisions and recommendations of the conferences of the Arab ministers of education, the first conference of the Arab ministers of science (Baghdad, February 1974).

3. Recommendations national commissions of the Arab countries.

4. Recommendations and suggestions of the expert meetings, symposia and seminars which the Arab Educational, Cultural and Scientific Organization holds in the context of the implementation of its programmes and their follow up.

Guidelines of Carrying out the Programmes

1. Benefiting of the available scientific potentialities in the Arab countries and extending its scope of functioning to the regional extent without hindering its original plans. ALECSO depends upon the Arab universities and scientific institutions in carrying out the training programmes of specialists and technicians (training teachers of mathematics and Biology at the Universities of Damascus, Ain-Shams, Cairo and Alexandria), training specialists in the field of identifying environmental pollution, at Alexandria and Baghdad Universities, training of specialists in chemical analysis at Cairo University, training the teachers of the agricultural science in Baghdad, training the specialists of the geological science in the Geological Survey of Egypt, training the technicians in the field of repair and maintenance of scientific instruments at the National Research Centre in Cairo, training the technicians of the electronics apparatuses in El Nasr Company Institute of Training of El-Nasr Company of T.V. and Electronic, in Cairo, etc.). ALECSO depends on the National Documentation Centre in Cairo in publishing the Arab Scientific Abstracts.

2. Benefiting from the Arab specialists and experts, through engaging them in expert groups, author's seminars, and conference, as this actual participation in scientific common work is the way for promoting of the Arab scientific cooperation.

3. Emphasis on a limited number of main long-term directions in the planning of programmes.

4. Planning and completion of the feasibility studies to establish the Arab specialized centres and their eventual establishments take a long time. These studies are supported by experimental programmes in the areas of the expected (or suggested) fields of these prospected centres. These experimental programmes would enrich the feasibility studies and point out both negative and positive aspects. Examples of these experimental programmes include:

   Introductory courses in the field of the scientific apparatuses as a part of feasibility studies for the establishment of an Arabic centre for scientific apparatuses. Experimental studies on: organization and management of the Arab universities, costs and economics of higher and university education in the Arab countries, are parts of the feasibility studies for the establishment of an Arab institute for research and development of higher and university education.

5. Co-operation and exchange of experiences with the Arab organizations (co-operation with the Association of Arab Universities concerning the introductory studies for establishing an Arab institute for research and development of higher and university education, co-operation with that Association in publishing the "Arab Scientific Abstracts, etc.

6. Co-operation with the international organizations, especially with the UN bodies (co-operation with the UNESCO in programmes of science teaching, environment programmes, science policy programmes, etc.; cooperation with the UNESCO and International Association of Universities in the preparatory studies for establishing an Arab Institute for research and development of higher and University education; co-operation with the International Centre of Educational Planning, in setting methodologies for studies on organization and management of the Arab universities and costs and economics of higher and university education : also co-operation with UNESCO in the preparation for the conference of Arab science ministers (CASTARAB).

7. Benefit of the technical and financial support of the special funds of the United Nations and of the Arab League (The United Nations Environment Programme provided about $ 180.000 in support for the environmental science programmes in 1974-1975).

8. Co-operation with other regional organizations.

The following pages present a translation of a condensed version of the Arabic text on ALECSO's activities in the field of science and technology.

3. SCIENCE PROGRAMMES

1974-1977

3.1 Scientific Publication

3.11 Publication of monographic scientific studies

a. ALECSO published the first volume of these studies: Aquatic Resources of the Arab Countries in 1972. The second: Underground Water Resources in the Arab Countries in 1973. These monographic studies aim at reviewing literature in Arabic countries and documenting it in a scientific monographic study. The first and second volumes have many positive aspects including up-to-date assessment of available scientific information which will guide researches in gap areas. But these publications have not covered completely the western parts of the Arab region. Provisions are made for the publication of two supplements to cover this gap.

- The monographic study on aquatic wealth in Arab countries included nine chapters as following :

  . Fishery of the Red Sea.
  . Fishery of the Arab Gulf.
  . Fishery of the north west of Indian Ocean.
  . The marine resources in Arab countries which share the Mediterranean coast.
  . Atlas indicating the distribution zones of fish and shrimp.
  . The aquatic wealth of the Egyptian north lakes.
  . The Fishery of Naser's lake.
  . The Fishery in the fresh water of Sudan.
  . The Egyptian Fisheries.

- The volume of the underground water resources in the Arab countries included chapters on the following Arab countries : Iraq - Syria - Sudan - Egypt - Libya - Arab Peninsula - Saudia Arabia.

b. Programmes of 1974-1975 included the publishing of the third study (The Medical plants of the Arab countries) which was to be edited by Prof. Abd-el Azeem Hefny Saber, who was faced by many obstacles through his work. The fourth study (phosphate in the Arab countries), is under publication.

c. Programmes of 1975 included the preparation for the fifth study (research of development the range in the Arab countries) which is edited by Dr. Omr Abd El-Migeed Daraz, volumes six and seven will deal with animal wealth and with dates and palm trees. The former will be done through cooperation with the Arab Centre for Arid Land Studies (Damascus), and the latter in cooperation with the Iraqi Center for date-palm research.

d. The programme includes a monographic study on desert environment.

e. It is suggested that ALECSO in cooperation with the Organization of the Arab Countries Exporting Petroleum publishes a monographic study on Oil research.

3.12 The Arab Scientific Abstracts

a. This periodical is published through the cooperation of ALECSO with the Association of Arab Universities, the Egyptian National Documentation Centre, and the UNESCO Regional Office in Cairo (ROSTAS). The first issue (two volumes, 1973) included the abstracts in the English language plus the titles in French; the second issue (two volumes, 1974), included the abstracts in both of French and English. Plus the titles in Arabic. The same system is followed in the third issue, 1975.

b. The periodical is to present abstracts of the scientific research published in, or carried out in, the Arab countries.

c. The development of this periodical includes two things, the first is trying to cover the abstracts of the scientific research which are published by all the scientific periodicals in Arab countries, the second is to include abstracts in Arabic, English and French languages (fourth issue, 1976).

3.2. Environmental Sciences and Natural Resources

(in Co-operation with UNEP)

3.21 Architecture and Environment in the Arab World

a. This programme aims at investigating architectural bases in planning human settlement, the design of buildings, and the selection of building materials, in order to provide suitable and comfortable houses with respect to the environment. ALECSO invited representatives of centres of building research in Khartoum, Cairo, Baghdad, and Kuwait, and a number of experts to meet in Cairo (6-11 April 1974). The meeting set a plan for the preparation of a series of scientific studies dealing with different aspects of this topics. In the light of further consultation with the experts of UNEP, the plan was slightly modified by adding topics : removal of waste in cities, city sewage systems, emphasis on historical review of elements of harmony between construction and environment in ancient times.

Some of the Arab experts were asked to prepare of these studies.

b. A meeting was held for the authors of these studies and a number of administrators responsible for carrying out housing projects in the Arab countries. The meeting (Khartoum, 11-20 October 1975) discussed those studies on the bases of practical experiences. The meeting provided guidelines for revising and editing the series of studies, and recommendations on the principles which should guide planning of human settlements in urban and rural regions, designing the building units, and selecting of building materials.

c. These studies were revised, edited, and prepared for publication to form an Arabic monographic study on Architecture and Environment.

3.22 Environment and Development

That project is a part of 1976-1977 programmes, in co-operation with UNEP and ECWA.

The project comprises holding a regional seminar for two weeks, and inviting a number of those concerned with the development planning in the Arab countries (25-30 persons), and a number of the international and Arab experts in the relation between environment and development (from 5 to 6 experts). The course includes a number of main topics, each to be covered in a 2-day session, in which the expert (environmental scientist) presents his point of view, then discussion takes place. The main topics include :

a. environmental principles for planning human settlements,

b. environmental principles for planning and distribution of industerial regions,

c. environmental principles for the development of the coastal regions and protection of the marine environment,

d. environmental aspects of river control projects,

e. environmental aspects of agricultural intensification and use of the agricultural chemicals,

f. environmental aspects of land reclamation,

g. environmental (national, regional and international) legislations.

3.23 Environmental Monitoring (training courses)

a. In co-operation with the University of Alexandria, and with the financial support from UNEP, ALECSO held a 6-month training course for specialists in the field of monitoring and surveillance of environmental pollution. The course was attended by 13 trainees from:Sudan, Jordan, Tunis, Iraq, Democratic Yemen Republic, Yemen Arab Republic, Syria and Kuwait.

b. The 1976-1977 programme includes holding of three specialized courses in the field of monitoring and surveillance of environmental pollution : air, water, food. Ten trainees will attend each workshop. The first course was held in the University of Alexandria (Higher Institute of Health) in the field of food contamination (June-August 1976). The second course will be held in the National Research Center (Cairo) in the field of air pollution (October-December 1976). The third course will be held in Baghdad in the field of water pollution. Each course will be 3-month duration.

3.24 Environmental Educational Programmes

The 1974-1975 programmes in environmental education had the following objectives :

a. Publication of a scientific source book that would help the planners of curricula and authors of the textbooks, in adding environmental aspects to the information of basic subjects of curricula (not addition of a new subject : environmental sciences).

b. Publication of a second source book that would contain the scientific material required for teaching a certain amount of environmental sciences to students of universities, institutes of higher studies and teachers training institutes, who do not specialise in environmental sciences. These two source books are being printed.

c. Design a plan for a higher degree course for the training of specialists in the environmental sciences.

d. Setting experimental models of media programmes on environmental information.

In July, 1975, ALECSO invited a number of deans of the science faculties in the Arab Universities to a workshop to discuss the design of a university degree in environmental sciences. The workshop proposed alternative plans for different degrees : B.A., Diploma, Master in environmental sciences. The recommendations of the workshop were presented to the Association of Arab University, and the Arab Universities.

In October, 1975, ALECSO held (in Baghdad), in co-operation with Iraq government, and Arab Broadcasting Union a training workshop. Forty trainees attended that course, they were representatives of the television and broadcasting stations in the Arab countries. The workshop concerned itself with the preparation of environmental information for television and radio programmes.

1976-1977 Programmes

a. A workshop will be held for a number of planners of curricula in the Arab countries to study the first source book (for school education) to prepare guidelines for the use of its material in permeating environmental aspects into scientific subjects in the curricula of the social studies, natural sciences, languages, and school activities.

b. A seminar will be held for a number of deans of teachers training institutes to discuss the place of environmental sciences in the curricula of training teachers.

c. Planning for the preparation of educational aids required for the application of the programme through various levels of public education. This will include holding a workshop course for a number of specialists in the field of educational aids in the Arab countries. The workshop will study the source book and to prepare a guidelines plan and instructions for preparation the types of educational aids.

d. As for the second source book(environmental education for higher institutions and universities) experts will be sent to various Arab countries to hold local seminars (in universities and institutes of higher studies) to discuss the use of the book.

e. For the utilization of mass media in dissemination of environmental information, several programmes will be carried out. These include :

- Preparation of suitable material for television and radio programmes.

- Setting up a prize in 1977 for the best programmes which have been produced locally on environmental aspects.

- Holding a one-month training course for editors of magazines, and newspapers who are interested in simplification the scientific information. This will be held in cooperation with the Arab Centre for Rural Development in Sers El Lyan.

3.25 Regional Programme for the Study of Red Sea Environment

a. ALECSO held a meeting for experts representatives of the Arab countries which share in the Red Sea and Gulf of Aden (Jordan, Saudi Arabia, Democratic Yemen, Yemen Arab Republic, Somalia, Sudan, Egypt), and Ethiopia (Jeddah I). Representatives of UNEP, UNESCO and I.O.C. attended the meeting which was held in co-operation Saudi Arabia Ministry of Water and Agricultural at King Abdel Aziz University in Jeddah, from 25 November to 1 December, 1974.

b. The members designed a plan for the preparation of a series of preparatory studies required for planning the regional programme. These studies were presented to the Jeddah II Conference : from 12 to 18 January 1976.

The studies included the following :

1. Regional survey for the actual scientific potentialities.
2. National plan for each country to support and develop its scientific machinery.
3. Detailed programme of the scientific research, including the coordinated methods of research and monitoring.
4. Detailed programme of environmental monitoring and surveillance of marine pollution, and a plan for establishment a regional network for environmental monitoring.
5. A draft of a regional convention for the protection of the Red Sea environment.
6. A study on the protected marine reserves.

7. A study on the organization of the machinery for the regional programme, including the establishment of reference groups, a center for information exchange, and a regional research center for marine environment.

8. A plan for a research vessel for (or vessels) to serve the regional programme.

c. The Jeddah II conference, was attended by delegations from : Jordan, Saudi Arabia, Yemen Arab Republic, Democratic Yemen, Somalia, Sudan, Egypt, and Ethiopia, the following organizations were also represented : the Arab League, Arab Academy of Naval Communication in Alexandria, the Regional Center of Radioactive Isotopes in the Arab countries, and the Common Saudi Arabia-Sudan Organization of the Exploitation of the Red Sea Resources, the United Nations Environmental Programme, the UNESCO, the International Oceanographic Commission the FAO, the IMCO, and the IUCN.

d. The conference concluded :

1. A draft of a regional convention for the environmental protection of the Red-Sea and Gulf of Aden, with protocols : one establishes the organization skeleton of a regional programme for the research studies and environmental monitoring.

2. Design the detailed programmes for the scientific research and environmental monitoring. This includes roles of national centers of research and roles of the regional programme.

3. A plan for establishing the regional machinery required for the programme: research center, oceanographic research vessel, fishery research vessel, referral center, center for marine information, monitoring net for environmental pollution, and a network of marine natural reserves.

3.26 Management of Nature Reserves : a training programme

a. Several countries reserve certain natural areas for conservation plants and animals in their natural habitat away from the effect of man. In a few of the Arab countries there are a limited number of these protected areas.

b. There is a protected area in Jordan (El-Azrak), which is one of the few protected areas in the desert environment in the Arab countries, it gained special international attention. It could become an international center : a station for studies on the protection of natural desert environments, and for training on management of protected natural areas in arid and semi-arid regions.

c. ALECSO, in co-operation with the management of the Azrak reserve (University of Amman), will hold a training course for Arab specialists on conservation of water, land biota, and natural environment in the arid and semi-arid regions.

3.3 Centre for Scientific Equipment : training courses

Training courses in 1974/1975

a. During 1974/1975, the organization held two training courses:

The first: for the specialists in the field of chemical micro-analysis, in co-operation with the Faculty of science of Cairo University, (from 28/9/1974 to 28/12/1974). Ten trainees attended the course, they were from : Iraq, Saudi arabia, Kuwait, Sudan, Syria, and Egypt.

The second: for the technicians in the field of the glassware apparatuses, in co-operation with the Egyptian National Centre for Scientific Equipments (from 15/6/1975 to 15/12/1975). Twenty-one trainees attended the course, they were from: Bahrain, Sudan, Lybia, Jordan, Iraq, Democratic Yemen, Kuwait, Saudi Arabia, Syria, and Egypt.

b. In 1975, two training courses were held.

The first : for the technicians in the field of mechanical scientific apparatuses in co-operation with the Egyptian National Centre for Scientific Equipment (From 15/3/1975 to 15/9/1975). Twenty-four trainees attended the course, they were from : Syria, Lebanon, Jordan, Saudi Arabia, Kuwait, Iraq, Bahrain, Sudan, Libya, and Egypt.

The second : for the technicians in the field of biological laboratories, in cooperation with the Faculty of science, Ain Shams University (from 1/5/1975 to 31/10/1975). Sixty trainees attended that course, they were from : Jordan, Bahrain, Tunis, Sudan, Syria, Iraq, Oman, Lebanon, Libya, Egypt, Morocco, Arab Yemen Republic, and Democratic Yemen.

Training Courses in 1976-1977

a. During 1976 ALECSO holds two training courses :

The first : for the tecnicians in the field of the electrical and electronic scientific apparatuses, in co-operation with the Research Center for Electrical Industries in Dar El Salam, Maadi (from 17/4/1976 to 17/10/1976). Eleven trainees attended that course, they were from : Sudan, Jordan, Palestine, Bahrian, Syria, Iraq, Egypt, Kuwait, and Democratic Yemen.

The second : for the technicians in the field of the physical laboratories in co-operation with the Egyptian National Centre for Scientific Equipment (from 1/10/1976 to 31/3/1977).

b. During 1977, ALECSO will hold two training courses.

The first : in the field of chemical micro-analysis for specialists, in co-operation with Baghdad University.

The second : in the field of mechanical scientific appliances for the technicians.

A comparison between the number of trainees from each country in the courses of 1972, 1973 and number of trainees in the courses of 1974, 1975.

Courses	Jordan	Emirates	Bahrain	Tunis	Algeria	Saudia	Sudan	Syria	Somalia	Iraq	Oman	Palestine	Kater	Kuwait	Lebanon	Libya	Egypt	Morocco	Mauritania	Arabic Yemen	Democ. Yemen	TOTAL
Courses of 1972/1973																						
Glass	1	-	1	-	-	2	1	-	-	3	-	-	-	-	-	1	4	-	-	-	1	14
Mecanics	2	-	-	-	-	3	2	-	-	2	-	-	-	1	-	1	4	-	-	1	1	17
Electronics	1	-	-	-	-	2	-	-	-	1	-	-	-	9	-	3	6	-	-	-	1	23
Total	4	-	1	-	-	7	3	-	-	6	-	-	-	10	-	5	14	-	-	1	3	54
Courses of 1974/1975																						
Chemistry	-	-	-	-	-	2	1	1	-	3	-	-	-	1	-	-	2	-	-	-	-	10
Glass	1	-	5	-	-	1	1	1	-	3	-	-	-	1	-	2	5	-	-	-	1	21
Mechanics	3	-	1	-	-	3	5	2	-	3	-	-	-	1	1	2	5	-	-	2	-	28
Biological Lab.	2	-	1	1	-	-	4	1	-	7	1	-	-	-	1	8	31	1	-	1	1	60
Total	6	-	7	1	-	6	11	5	-	16	1	-	-	3	2	12	43	1	-	3	2	119

3.4 Technology of Science Teaching

3.41 Development of Mathematics Teaching in the Secondary School

In 1967-1972 UNESCO initiated a programme for teaching modern mathematics in secondary schools of the Arab countries. Several of these countries adopted the project and experimented with the new textbooks, or with their revised editions. The UNESCO programme was over in 1972. ALECSO undertook to follow up the project using various means.

a. Training

1. Training workshops and courses

In the summer of 1972, a course was held at the Faculty of science, Cairo University, where twenty-five secondary school teachers from Bahrain, Katar, Emirates were trained.

In the summer of 1973, three courses were held; the first at the Faculty of Education, Ain-Shams University, with ninty-five teachers from nine Arab countries; the second, at the Faculty of Science, Cairo University, with eighty-eight teachers from eight Arab countries; the third, at the Faculty of Science, Ain-Shams University, with seventy-two teachers from eight Arab countries.

In summer of 1974, five courses were held ; the first, at Faculty of Education, Ain-Shams University; the second, at the Faculty of Education, Alexandria University; the third, at the Faculty of Science, Cairo University; the fourth and fifth at the Faculty of Science, Damascus University. About 300 teachers attended these courses.

In summer of 1975, five courses were held; the first, at the Faculty of Education, Ain-Shams University; the second, at the Faculty of Education, Alexandria University; the third, at the Faculty of Science, Cairo University; the fourth and fifth were at the Faculty of Science, Damascus University. About 400 teachers attended these courses.

In summer 1976, five similar courses will be held. About 500 teachers are expected to attend these courses.

2. Training by "flying" teams

ALECSO sent teams of experts (teaching of modern mathematics in the secondary school) to Katar, where they shared in carrying out the local training courses during the school-year, 1973-1974, and during the school year 1974-1975.

b. Evaluation

ALECSO held a workshop in Damascus (from 5-10 July 1975) to evaluate the experiment of teaching the modern mathematics in secondary school. Members of that workshop were Arab experts in the field, and international experts (UNESCO) who shared in planning that programme. The curricula, books, and methodologies were revised, according to reports and studies on the experiment presented by each of the participating countries, indicating negative and positive aspects.

Plan during 1976-1977

That plan aims at further development of curricula and textbooks of mathematics in secondary school. The need for this development emanated from the results of experiences with the UNESCO initial programme, ALECSO's project of modern mathematics for preparatory schools. The plan emphasizes the special importance of continuous training programmes of teachers by holding training courses in co-operation with the Arab Universities, in addition to the "flying team" system.

a. Development of curricula and textbooks

1. ALECSO held the first workshop for specialists of development mathematics teaching in the secondary school level in the Arab countries: the Faculty of Education, Alexandria University from 20 to 29 March 1976. Participating experts were twenty-three from : Jordan,

Bahrain, Tunis, Algeria, Iraq, Syria, Katar, Libya, Egypt and Democratic Yemen. The workshop adopted a developed curriculum of mathematics for the secondary level. Then set a detailed curriculum for the first secondary grade; plan for the first secondary grade book, and for its companion the teacher guide.

2. Experts are invited to prepare draft chapters of the first secondary gradebook, and the teacher guide.

3. ALECSO will hold an authors workshop late in 1976, to discuss and revise the written chapters, and to set plan for the second secondary grades books.

4. ALECSO will then commission a scientific editor for the first book, which will be published before the end of May 1977.

5. Experts will be invited to prepare draft chapters of the two books (student and teacher) of the second secondary grade.

6. ALECSO will hold an authors workshop in August 1977 to revise the drafts of chapters of the two books of the second secondary grade; and to set plan for the third secondary grade books.

7. ALECSO will then commission a scientific editor for the two books, and publish them before the end of May, 1978.

8. The project part of publishing books for the three grades will be completed by May 1979.

b. Training

1. The developed book of the first secondary grade will be ready for experiment in the school year 1977-1978. A training course will be held in the summer of 1977, for leaders (directors and senior teachers) on basis of the developed books of first and second secondary grades. At that time, the first secondary grade book, and draft of the second secondary gradebook, will be available.

Training courses for teachers and directors of the modern mathematics in the Arab countries, 1974

Number of trainees Course / State	The first secondary grade, Faculty of Education, Ain-Shams 13/7 - 14/8/1974	The Second secondary grade, Faculty of Education, Alexandria 13/7 - 14/8/1974	The third secondary grade, Faculty of Science, Cairo 13/7 - 14/8/1974.	The first secondary grade, Faculty of science, Damascus 1/7 - 31/7/1974	The second secondary grade, Faculty of Science, Damascus, 1/7 - 31/7/1974	Total
Jordan						
Emirates	4		23			27
Bahrain	1	7	3	3	3	17
Tunis						
Algeria				1	1	2
Sudan	3	4	3			10
Somalia						
Iraq	9					9
Saudia	20	20	1			41
Syria				20	59	79
Yemen						
Oman						
Palestine						
Katar		16				16
Kuwait		3	6		2	11
Libya	5	4		1		10
Lebanon						
Egypt	43	23	27			93
TOTAL	85	77	63	25	65	315

Training courses for teachers and directors
of modern mathematics in the Arab countries,1975

Course trainees number / State	The First Secondary grade Faculty of Education, Ain-Shams Univ. 7/12 - 13/8/75	The Second Secondary grades Faculty of Education Alexandria Univ. 7/12 - 13/8/75	The third secondary grade Faculty of Science, Cairo 7/12 - 13/8/75	The Second secondary grade Faculty of Science, Damascus 7/12 - 13/8/75	The third secondary grade Faculty of Science, Damascus 7/12 - 13/8/75	The first and second mediate grades, Faculty of Science, Ain Shams Univ. 7/19 - 20/8/75	T O T A L
Jordan							
Emirates	5	5	16				26
Bahrain	10	7	11	4	2	17	51
Sudan	4						4
Saudia	36			10	9		55
Syria				45	72		117
Oman						2	2
Katar			6		10	1	17
Kuwait	8	6	13	4	8	22	61
Libya	4	5	3	5	3	16	36
Egypt	12	23	3			1	39
TOTAL	79	46	52	68	104	59	408

3.42 Development of Mathematics Teaching in the Preparatory School

ALECSO held a number of workshops for development of mathematics teaching in the preparatory school. The first was held in Alexandria from 8 to 13 July 1972. In that meeting the Arab experts set a plan for the programme including : detailed curricula, steps for publication of books, training, and experimentation. The second was held in Kuwait from 21 February to 8 March 1973, to revise draft chapters of the students book and teacher's guide of the first grade, which were prepared by invited Arab experts; and to set a plan and curricula of the second grade. Student's book of the first grade, was finally printed in Damascus, distributed to ministries of education in Arab countries. Some of these countries assigned a number of preparatory schools to experiment with the new curriculum and the book. These countries were : Egypt, Iraq, Katar, Emerates, and Oman.

The third workshop was held in ALECSO headquarters in Cairo, from 28 September to 15 October 1974. The meeting discussed and revised chapters of student's book and teacher's guide for the second preparatory grade. The books were edited and printed and sent to the Arab countries.

The fourth workshop was held in Katar (El Doaha), chapters of the third grade book and the teacher's guide were revised and approved; the experiments of teaching the first and second books were discussed. The meeting set a plan for training leaders to prepare local training courses in the Arab countries for training teachers on the developed curricula.

ALECSO held a training course for directors and senior teachers of mathematics in the preparatory level, in the summer of 1975, at the Faculty of Science, Ain Shams University. Eighty five leaders from nine of the Arab countries attended the course. Also the organization sent the experts, "flying team, to Katar, where they assisted with a training course held by the Ministry of Education in the school year 1974-1975.

Plan for 1976-1977

1. Publication of the teacher guide, and student book for the third preparatory grade before the end of June 1976.

2. Holding a training course of the directors and senior teachers in the summer of 1976 : using books and curricula of the three grades. The course will be repeated in the summer of 1977.

3. Sending the experts (flying team) to the Arab countries which hold local training courses during the school year.

4. ALECSO will hold a workshop in the summer of 1977. It will aim at constructing the assessment means of the curriculum through ideal tests, and correct educational standards. These studies will help in the development of systems of examinations, and emphasize the concept of the comprehensive curriculum which includes the evaluation means.

Development of Mathematics Teaching at the Elementary Level

A meeting of Arab experts was held in ALECSO headquarters (Cairo) from 11 to 15 October 1974, to study the possibility of development of mathematics teaching in the elementary school. Fifteen experts from nine Arab countries attended the meeting and discussed a number of working papers. The meeting recommended not to proceed at present with developing mathematics teaching in that level, until ALECSO programmes with the development of Secondary and preparatory curricula are completed.

3.43 Development of Biology Teaching in the Secondary School

The pioneer project of development of biology teaching aims at designing a general frame of a developed curriculum of biology applicable, with local adaptations, in the secondary school in the Arab countries. The project started in 1972. Several workshops and expert

meetings were held in Cairo, Baghdad, Oman and Tripoli. Members of these meetings were from the Arab experts concerned with biology teaching, and international experts who worked in similar projects (UNESCO or national). Outcome of these meetings and workshops included :

- Publication of five booklets outlining the phases of the project. These included details of the subjects of biology curriculum for the three secondary grades, and the English translation of the comprehensive curricula.

- Publication of the student book of biology and the teacher guide for the first secondary grade. Copies of these books were sent to all of Arab countries to study the possibility of its experimentation in the school year 1974-1975. The following Arab countries carried out experimentation of the developed curricula in their schools through the school year 1974-1975: Jordan, Saudi Arabia, Oman, Sudan, Democratic Yemen, and Mauritania.

- Publication of student book and teacher guide of the second secondary grade, these books have been printed in Amman (Jordan).

- Books for the third secondary grade are being prepared. Eleven experts from nine Arab countries shared in writing chapters of student books and the teacher guide of the third secondary grade. A seminar was held in El-Ryad (Saudi Arabia), where the materials of these books were discussed, and revised. The books will be published by the end of 1976.

- In 1975, two training courses were held for biology teachers in the secondary school (for the first and second grades), at the Faculties of Science in Ain-Shams and Alexandria Universities, during August and September. Also a workshop was held for the leaders of biology in the Faculty of Science in Alexandria University in the July 1975.

The course/ number of trainees	The first secondary grade, Faculty of Science, Alexandria University	The second secondary grade, Faculty of Science, Ain-Shams University	Workshop : leaders Faculty of Science, Alexandria University	TOTAL
	5 - 31/7/75	2 - 28/8/75	26 - 31/7/75	
Emirates	3	-	1	4
Bahrain	2	2	-	4
Sudan	-	-	1	1
Iraq	11	5	3	19
Saudia	8	8	2	18
Syria	-	-	1	1
Oman	-	-	3	3
Kuwait	1	8	1	10
Libya	-	11	1	12
Egypt	-	-	5	5
TOTAL :	25	34	18	77

Plan for 1976-1977

The work plan of the project of development the biology teaching in secondary school in Arab countries during 1976 and 1977, include :

a. Publication of student's books and the teacher's guide of the third secondary grade.

b. Holding the following training courses for the directors and senior teachers of biology in the secondary level.

- Specialised (each for one grade) training courses in Egyptian universities.
- Two training courses for teachers of the three secondary grades in Jordan and Iraqi universities.
- Two study workshops for the leaders and directors responsible of implementation the project in the Arab countries.
- Sending (flying teams) to assist with local training courses in Arab countries.

c. Providing technical assistance for the implementation of the project in countries that request this assistance.

d. Educational aids in biology

Teaching biological sciences, teachers need educational aids to help in teaching and also to help the student with practical studies. In 1977, a meeting will be held for specialists of the educational aids and Arab experts who participated in formulationg the curricula. The meeting will discuss, design and implementation of audio-visual aids, in teaching biology for the three secondary grades.

e. Preparation for assessment means for the biology curriculum

Generally, evaluation of student's achievement depends on tradional methods, which are in the form of : four or five general questions given at

the end of the school year to assess the student's acquisition of the scientific subject; or periodical oral or written tests. These methods have their disadvantages. Teachers are unable to evaluate student practical work.

ALECSO held, from 3 to 8 April 1976, a seminar at Ain-Shams University to prepare means of scientific assessments of the biology curriculum. Participants included fifteen experts from : Katar, Tunis, Sudan, Syria, Saudi Arabia, Iraq, Oman, and Egypt; one expert from UNESCO and one from Nuffield Project for Science Teaching in U.K. The meeting studied means for preparation guidelines for modern evaluation means in biology.

f. Meeting of experts and planners

An expert meeting will be held in 1977. It will be preparatory for an extended Arabic meeting to review the new trends in biology, and to assess the Arab experiment.

Agricultural Education, in co-operation with UNESCO

A training course was held for teachers of the agricultural secondary schools in the Agricultural Secondary School, Baghdad, Iraq from 21 October to 19 November 1974. Members of that course were thirty teachers working in the agricultural secondary education in : Iraq, Saudi Arabia, Jordan, and Syria. The programme included subjects concerned with technology of agricultural secondary education, social, economic aspects of agricultural education.

3.44 Development of Integrated Science Teaching

The science curricula of the preparatory level in the Arab countries are different from two sides : their organization, and content. The concept of teaching integrated science, was adopted in some countries through all of the level or in some of its grades. In addition, the integrated science concept itself differs according to curricula designers.

UNESCO initiated experimental programmes to develop teaching of the integrated sciences in some regions of Latin America. Regional organizations in Africa and Asia, make studies and experiments to develop science, teaching in preparatory school, based on the integrated sciences concept. This trend intends to present sciences to students of that level in a natural way.

The present experiment initiated by ALECSO to develop teaching of mathematics in preparatory schools, shows the need for development of science curricula in that level. A meeting was held in Alexandria (from 19 to 24 July 1975). Participants were a number of Arab experts interested in development of science teaching in the preparatory level, and one expert in that field from UNESCO.

That meeting discussed working papers and reports presented by experts, which described the actual science teaching in the Arab countries. At present science curricula at that level are based on teaching separate units of chemistry, physics, biology, and geology. The meeting revised the international studies in the field of integrated sciences of the elementary and preparatory levels, especially the UNESCO project of that field. A plan for a pioneer project, was set to be implemented by ALECSO through the next years.

Plan for 1976-1977

a. Holding a meeting for the Arab experts and some international experts to put a integrated frame for the curricula of all the preparatory grades and details of the first grade curriculum.

b. Inviting some of the Arab experts to draft chapters of the student book and the teacher guide of the first grade.

c. Holding a meeting for authors to revise the drafts of the two books and to put the details of the second grade curriculum.

d. Publication of the first grade books, and sending a number of copies for experimentation to the Arab countries according to their demand.

e. Asking a number of experts to draft chapters of the second grade books.

f. Holding a meeting for authors to revise the drafts of the second grade books; and to set details of the second grade curriculum.

First meeting ALECSO held a meeting from 2 to 11 May 1976 at the Faculty of Education, Ain Shams University. Eleven Arab experts attended the meeting, they were from: Jordan, Saudi Arabia, Syria, Sudan, Iraq, Katar, Libya, and Egypt; together with two international experts, one from UNESCO, the other from Naffield Project for Development of Science Teaching in U.K. That meeting put an integrated frame for the science curriculum of preparatory school grades, and details of the first grade.

3.45 Development of Teaching Physics in the Secondary School

As was described earlier, ALECSO carried out pioneer projects in biological sciences at the level of secondary school, and in teaching of mathematics at the preparatory level; and maintained follow-up development of the UNESCO Project Mathematics in Secondary Schools.

In view of the close relation between physics and mathematics in the high school level, ALECSO carries out a regional programme for development of teaching physics.

Plan of 1976-1977

a. An expert meeting to review the present position of teaching physics in Arab countries, to set the objectives of development, and to design a plan for the curricula of the three grades in the secondary school.

b. Experts will be invited to write chapters of a student text book and a teacher guide in physic for the first secondary grade.

c. A seminar will be held to discuss and revise the drafts of the two books, and to set the details of curriculum of second grade.

d. The two books of the first grade will be ready for experimental testing in Arab countries.

e. Arab experts will be invited to write the student book and the teacher guide for the second secondary grade.

f. A seminar will be held to discuss and revise the drafts of two books, and to design the details of curriculum of the third grade.

For the executation of this plan, ALECSO held the first meeting (Cairo, 1976) for the experts in the development of teaching physics in Arab countries, (18 experts from Jordan, Tunisia, Sudan, Kuwait, Iraq, Syria and Egypt), an expert participated from the Jaffield Project for Developing Sciences Teaching in U.K., and the President of Harvard Project for Physics in U.S.A.

The experts reviewed the present position of teaching physics in Arab country, and the two projects from U.K. and U.S.A. The meeting set a developed out line for the three grades in the secondary school. A second seminar will be held in Baghdad before the end of 1976, to prepare the details of the curriculum of the first secondary grade and the practical experiments, audio-visual aids, the students activities.

3.46 Development of Science Teaching Machinery

Developing science and mathematics teaching on sound scientific bases requires, in addition to the pioneer projects carried out by ALECSO, the establishment of machineries that would carry on this responsibility on continuous basis. The machinery should include local bodies that have their responsibilities in developing teaching sciences and mathematics at national level. It may be needed to institute a regional centre to coordinate the work of these national units.

National Technical Committees

ALECSO invited two experts to study structure and functions of national committees for development of science teaching. The studies were sent to Arab countries inviting them to form these national committees, and to exchange experiences among national committees and centres.

Plan for 1976-1977

a. Continuation of issuing the periodical newsletter twice a year.

b. Experts will be available to visit Arab countries to assist in the reinforcement of the present national committees, and to assist in establishing such committees where needed.

c. To design the structural organization of local centre for developing sciences and mathimatics teaching.

3.5 Scientific Research and Development

a. ALECSO held the first conference for Arab ministers of science and heads of scientific councils in the Arab countries in Baghdad (4-7 February 1974). It made a number of recommendation for national development of science policy and for regional coordination.

b. ALECSO held a seminar in Cairo (1-6 February 1975) for Arab experts in the field of scientific planning in Tanisia, Lebanon, Iraq, Jordan, Kuwait, Saudi Arabia, Libya and Egypt, to set a plan to implement the resolutions of Baghdad conference.

c. UNESCO held (in cooperation with ALECSO) a seminar in Kuwait (22-27 March 1973) of the Arabs experts who work in the field of scientific planning in Algeria, Egypt, Lebanon, Iraq, Jordan, Kuwait, Libya, Saudi Arabia and Palestine to make a plan for the preparation for CASTARAB.

d. Syria proposed the establishment of an Arab Foundation for scientific research. This was discussed at the seventh Arab Summit Conference (El-Rabat 1974). ALECSO was asked to prepare a study towards the establishment of such foundation. This study is completed and it is one of the documents available at CASTARAB.

Plan for 1976-1977

ALECSO will carry out a series of preparatory studies for the establishment of a series of Arab regional bodies :

Arab centre for solar energy research.
Arab centre for electronic research and technology.
Arab scientific documentation centre.
Arab centre for the development of teaching sciences and mathematics.

3.521 Arab centre for solar energy research

a. There exists in Khartoum and in Cairo research units for solar energy, an institute was initiated in Algerie for research on solar energy.

b. The regional meeting which the UNESCO held in Cairo for experts from Arabic and African countries recommended to follow up the resolutions of CASTAFRICA (Dakar, January 1974) that ALECSO with UNESCO support should develop the institution for solar energy research in Khartoum to become a centre for research and training at the regional level.

c. ALECSO is carrying out a preparatory study to establish an Arab centre for solar energy studies.

Plan for 1976-1977

1. Field visits by experts for making a survey of the existing centres and research activities (Sudan, Egypt, Algeria, Saudi Arabia, etc.).

2. Visiting solar energy scientific centres in a number of countries outside the Arab region, e.g., Soviet union, France, India, U.S.A. with a view to exploring organizational structures and scientific programmes of these centres.

3. Holding a meeting, with the co-operation of UNESCO, for number of Arab and international experts for planning programmes of research and scientific and technogical studies and training which a regional centre for solar energy research may carry out.

4. The preparatory study will also discuss : the establishment of regional centre, or the transformation of one of the present Arabic centres to a regional centre.

5. ALECSO formed a core-group for the study.

Arab countries were asked to nominate specialists in solar energy, and to form a national committee for solar energy research.

3.522 Arabic centre for electronic research and technology

ALECSO will prepare a detailed study about the establishment of this Arabic centre in cooperation with the Egyptian Academy of Scientific Research and Technology.

3.523 Arab scientific documentation centre

The establishment of the Arab centre for scientific documentation was one of the recommendations of the conference of Arab ministers of science (Baghdad February 1974). The Expert Meeting (Cairo, February 1975) put the following elements as basis of a feasibility study for the establishment of this centre.

1. It is necessary that the decision-makers responsible of scientific activity in Arab countries be convinced of the high priority of the establishing an Arab centre for scientific documentation. It is also necessary to determine the objectives of the centre and its relation with documentation centres both at national and international levels.

2. The centre will depend upon the supply of information given to it by the regional network of centres in the Arab world. It is necessary to evaluate the machinery of each Arabic institution in the light of its bibliographical and documentation activities. Also it is necessary to survey the scientific activities in each country and evaluate the present co-operation between Arab countries through evaluating cooperative projects.

3. There is shortage in the trained manpower needed for the centre at all levels. It is necessary to explore means for training of those levels utilizing both international and Arab potentialities.

4. The regional centre is a complex organization realizing the coordination by means of exchanging data in and within Arab countries.

5. The centre would eventually provide service to the scientific documentation in the Arabic language. It is necessary, therefore, to adapt recent technological advances to the specific characteristics of the Arabic language together with other language.

6. The Arab centre of scientific documentation must be connected with specialized national centres, with international programmes and international institutions for the information and scientific data exchange.

Work Plan 1976-1977

1. A questionnaire about the informations and documentation centres was sent to Arab countries in January 1976.

2. An expert group met (Cairo, May 1976) to discuss the work plan for the preparatory study.

3. Teams of experts will visit documentation centres starting on the first in Arab countries and outside the region (June-Decmeber 1976).

4. Reports of these teams will be submitted to the expert group (second to prepare session, January 1977).

5. The study will be prepared for publication at the end of March 1977.

3.524 Arab centre for the development of teaching science and mathematics

A joint ALECSO-UNESCO team visited during 1975 the following countries : Egypt, Lebanon, Iraq, Kuwait, Jordan, Tunisia. The purpose was to discuss with the institutions and specialists the development of science and mathematics teaching, to survey the existing machineries in these countries, and to evaluate the need for development in this area.

The reports of the team showed the need for developing science and mathematics teaching, and the needs for a system that would reinforce regional cooperation in this field.

During 1976-1977 a preparatory study on the establishment of an Arab centre, with a network of units at national level, will be undertaken by ALECSO in cooperation with UNESCO.